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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/560,448	Applicant(s) BOURRET ET AL.	
	Examiner Trang U. Tran	Art Unit 2622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 July 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-17 and 20-50 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-17 and 20-50 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed July 28, 2009 have been fully considered but they are not persuasive.

Applicants argue that Kuhn fails to disclose matching sub-elements of two images to remove the effects of misalignments within an image, Kuhn fails to disclose compensating for movement of parts of a image relative to the image as a whole and to other part of the image because Kuhn describes compensating for movement of a whole image relative to a corresponding whole image, there is no reference in Kuhn to shifting only a part of the image, and Wolf fails to resolve the above-described deficiencies of Kuhn.

In response, the examiner respectfully disagrees. It is noted that claim 1 has been amended to include "matching, by execution of a computer system, sub-field/frame elements of a test video field/frame with corresponding sub-field/frame elements of at least one reference video field/frame, and thereby generating for the test video field/frame a matched reference field/frame comprising the sub-field/frame elements of the at least one reference video field/frame which match to the sub-field/frame elements of the test video field/frame". Kuhn discloses in col. 2, lines 41-47 that "The detection requires access to a reference image (an image from the original video sequence or corresponding to it exactly) or a portion of it, such as a single line. For example if a known alignment pattern is inserted into the original video sequence, the reference image may be generated at the measurement instrument to correspond

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exactly to the inserted alignment pattern". From the above passage, it is clear that Kuhn teaches the matching of the test alignment pattern corresponding the reference alignment pattern. Kuhn additionally discloses in col. 4, lines 65-67 that "Although a specific pattern was used for illustration, any known pattern, including a variable frequency pattern or one taken from the image itself, may be used". When the image is used for the alignment pattern, Kuhn's system will match sub-field/frame elements of a test video field/frame with corresponding sub-field/frame elements of at least one reference video field/frame, and thereby generating for the test video field/frame a matched reference field/frame comprising the sub-field/frame elements of the at least one reference video field/frame which match to the sub-field/frame elements of the test video field/frame as required by the claims.

It is noted that claim 1 does not specifically claim compensating **only** parts of an image relative to the image as a whole and to other parts of the image. The compensating for movement of a whole image relative to a corresponding whole image of Kuhn including the compensating parts of an image relative to the image as a whole and to other parts of the image of claim 1 and, thus, anticipates claim 1.

Claim Rejections – 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-6, 17-25 and 36-40 are rejected under 35 U.S.C. 102(b) as being anticipate by Kuhn (US Patent No. 6,295,083 B1).

In considering claim 1, Kuhn discloses all the claimed subject matter, note 1) the claimed matching, by execution of a computer system, sub-field/frame elements of a test video field/frame with corresponding sub-field/frame elements of at least one reference video field/frame, and thereby generating for the test video field/frame a matched reference field/frame comprising the sub-field/frame elements of the at least one reference video field/frame which match to the sub-field/frame elements of the test video field/frame is met by the cross-correlations which is matching between the test image and the reference image (Figs 1-2, col. 2, line 25 to col. 3, line 59 and col. 4, line 65 to col. 5, line 13), and 2) the claimed generating, by execution of the computer system, a video quality value in dependence on the matched sub-field/frame elements of the test and matched reference video fields/frames so as to reduce the adverse effects of sub-field/frame misalignments between the reference and test field/frames is met by the Picture Quality Analysis System PQA200 (Figs 1-2, col. 2, line 25-55).

In considering claim 2, the claimed wherein the matching step further comprises, for a sub-field/frame element of the test video field/frame, searching for a matching sub-field/frame element within M1 preceding and/or M2 succeeding reference video fields/frames to a temporally corresponding reference video field/frame to the test video field/frame is met by the cross-correlations which is matching the alignment pattern may be (seven lines in height with alternate black and white blocks) between the test image and the reference image (Figs 1-2, col. 2, line 25 to col. 3, line 59).

In considering claim 3, the claimed wherein M1 and M2 are predefined is met by the cross-correlations which is matching the alignment pattern may be (seven lines in height with alternate black and white blocks) between the test image and the reference image (Figs 1-2, col. 2, line 25 to col. 3, line 59).

In considering claim 4, the claimed wherein the searching further comprises searching within a spatially bounded region of the reference video fields/frames about the corresponding position within the reference fields/frames as the test sub-field/frame element takes within the test video field/frame is met by the cross-correlations which is matching the alignment pattern may be (seven lines in height with alternate black and white blocks) between the test image and the reference image (Figs 1-2, col. 2, line 25 to col. 3, line 59).

In considering claim 5, the claimed wherein the spatial bound of the search region is predefined is met by the cross-correlations which is matching the alignment pattern may be (seven lines in height with alternate black and white blocks) between the test image and the reference image (Figs 1-2, col. 2, line 25 to col. 3, line 59).

In considering claim 6, the claimed wherein the matching further comprises, for a sub-field/frame element of the test video field/frame: defining a matching template comprising a portion of the test video field/frame including the sub-field/frame element; and using the defined matching template to search for matching sub-field/frame elements in the at least one reference video field/frame is met by the cross-correlations which is matching the alignment pattern may be (seven lines in height with alternate

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black and white blocks) between the test image and the reference image (Figs 1-2, col. 2, line 25 to col. 3, line 59).

Claim 17 is rejected for the same reason as discussed in claim 1 above.

Claim 18 is rejected for the same reason as discussed in claim 1 above.

Claim 19 is rejected for the same reason as discussed in claim 1 above.

Claims 20-25 are rejected for the same reason as discussed in claims 1-6, respectively.

Claims 36-40 are rejected for the same reason as discussed in claims 2-6, respectively.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 7-16, 26-35 and 41-50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuhn (US Patent No. 6,295,083 B1) in view of Wolf et al. (US Patent No. 5,446,492).

In considering claim 7, Kuhn discloses all the limitations of the instant invention as discussed in claim 1 above, except for providing the claimed wherein the matching further comprises calculating one or more matching statistic values and/or matching vectors; and wherein the generating step generates the video quality parameter in further dependence on the calculated matching statistic values and/or matching vectors.

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Wolf et al teach that the source and destination spatial statistics processors 22 and 30 compute the standard deviation of the pixel contained within the Region Of Interest (ROI) for which the video quality is to be measured, the ROI may be the entire image, but preferably it is a small subset of the pixels forming the entire image (Fig. 2, col. 6, line 3 to col. 8, line 38). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to incorporate the calculating statistic value as taught by Wolf et al into Kuhn's system in order to provide a method of measuring video quality that agrees closely with the perceptual video quality obtained from large panel of human viewers.

In considering claim 8, the claimed wherein the calculating comprises: constructing one or more histograms relating to the searched area (s) of the reference video field (s)/frame (s); and calculating a matching statistic value for each histogram relating to the proportion of matched elements which contribute to the peak of the histogram is met by the source and destination spatial statistics processors 22 and 30 compute the standard deviation of the pixel contained within the Region Of Interest (ROI) for which the video quality is to be measured, the ROI may be the entire image, but preferably it is a small subset of the pixels forming the entire image (Fig. 2, col. 6, line 3 to col. 8, line 38 of Wolf et al).

In considering claim 9, Kuhn discloses all the limitations of the instant invention as discussed in claim 1 above, except for providing the claimed wherein the generating further comprises: calculating a plurality of video characteristic values respectively relating to characteristics of the test and/or reference video fields/frames in dependence

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on the matched sub-field/frame elements of the test and reference video fields/frames; and integrating at least the calculated video characteristic values together to give the video quality value. Wolf et al teach that the source features 7 and the destination features 9 are used by the quality processor 35 to compute a set of quality parameters 13 (p_1, p_2, \dots) and quality score parameter 14 (q), ...the design process determines the internal operation of the statistics processors 22, 24, 30, 32 and the quality processor 35 (Fig. 2, col. 4, line 8 to col. 5, line 38). Therefore, it would have been obvious to one ordinary skill in the art at the time of the invention to incorporate the calculating plurality of the video characteristic values as taught by Wolf et al into Kuhn's system in order to provide a method of measuring video quality that agrees closely with the perceptual video quality obtained from large panel of human viewers.

Claim 10 is rejected for the same reason as discussed in claim 7 above.

In considering claim 11, the claimed wherein the video characteristic values are respectively any two or more of the following values: one or more spatial frequency values; one or more texture values; at least one edge value; at least one luminance signal to noise ratio value; and/or one or more chrominance signal to noise ratio values is met by the edge values (Figs. 1C and 1D, col. 3, line 5 to col. 4, line 3 of Kuhn).

In considering claim 12, the claimed wherein the calculation of the edge value comprises, for a test field/frame: counting a number of edges in each sub-field/frame element of the test field/frame; counting a number of edges in each sub-field/frame element of the at least one reference field/frame matched to the sub-field/frame elements of the test field/frame; and determining an edge value for the test field/frame in

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dependence on the respective counts is met by the buffer register stores the values of a group of pixels surrounding both the rising and falling edges of the alignment blocks (Figs. 1C and 1D, col. 3, line 5 to col. 4, line 3 of Kuhn).

In considering claim 13, the claimed wherein the determining further comprises: calculating difference values between each pair of respective counts; putting each calculated difference value to the power Q ; summing the resulting values to give a sum value; and putting the sum value to the power $1/Q$ to give the edge value is met by calculating the different between the pixel and the pixel shift (Figs. 1C and 1D, col. 3, line 5 to col. 4, line 3 of Kuhn).

In considering claim 14, the claimed wherein the integrating further comprises weighting each value by a predetermined weighting factor; and summing the weighted values to give the video quality value is met by the shifting of the image is performed by interpolation using an appropriate filter such as a linear or $\sin x/x$ filter (Fig. 3, col. 4, lines 4-64 of Kuhn).

In considering claim 15, the claimed wherein the summing is further arranged to sum the weighted values with a predetermined offset value is met by the shifting of the image is performed by interpolation using an appropriate filter such as a linear or $\sin x/x$ filter (Fig. 3, col. 4, lines 4-64 of Kuhn).

In considering claim 16, the claimed wherein the weighting factors and the offset value are dependent on the type of the test and reference video fields/frames is met by the shifting of the image is performed by interpolation using an appropriate filter such as a linear or $\sin x/x$ filter (Fig. 3, col. 4, lines 4-64 of Kuhn).

Claims 26-35 are rejected for the same reason as discussed in claims 7-16, respectively.

Claims 41-50 are rejected for the same reason as discussed in claims 7-16, respectively.

Conclusion

6. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Trang U. Tran whose telephone number is (571) 272-7358. The examiner can normally be reached on 9:00 AM - 6:30 PM, Monday to Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lin Ye can be reached on (571) 272-7372. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

November 9, 2009

/Trang U. Tran/
Primary Examiner, Art Unit 2622